

(12) UK Patent Application (19) GB (11) 2 140 976 A

(43) Application published 5 Dec 1984

(21) Application No 8409480

(22) Date of filing 12 Apr 1984

(30) Priority data

(31) 3316687

(32) 6 May 1983

(33) DE

(71) Applicant
Spinner GmbH (FR Germany),
Erzgiesserei strasse 33, D-8000 Munchen, Federal Republic
of Germany

(72) Inventor
Georg Spinner

(74) Agent and/or Address for Service
D. Young & Co.,
10 Staple Inn, London WC1V 7RD

(51) INT CL³
H01P 1/28

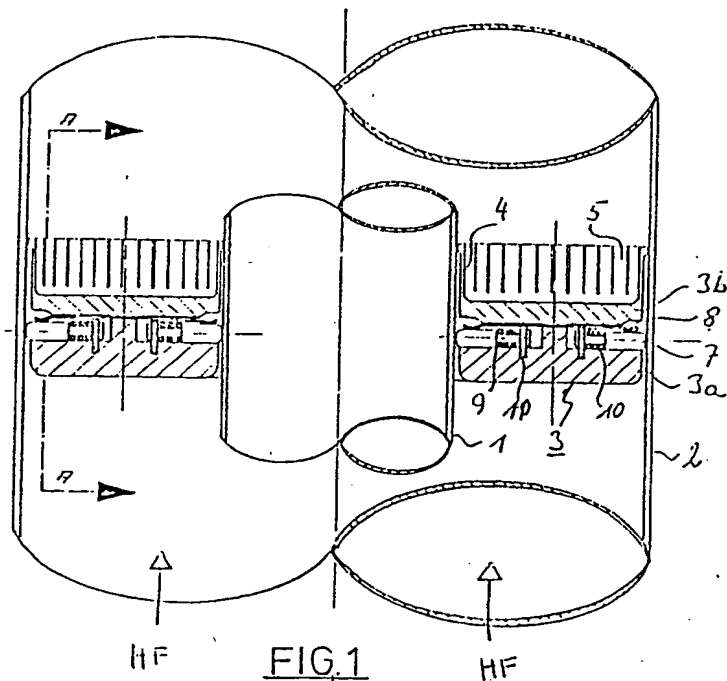
(52) Domestic classification
H1W 1 2 3B1 GP
U1S 2204 H1W

(56) Documents cited
None

(58) Field of search
H1W

(54) HF line with a displaceable contact means

(57) An HF line is provided with a displaceable contact means (3), e.g. a short circuiting slide, which contains cylindrical contact rods (7) in order to achieve a high current carrying capacity. The contact rods are guided in notches of V-shaped cross section in the short circuiting plate (3a) and are loaded by helical compression springs (10). The rods (7) are held in the notches (6) by biased leaf springs (8), provided inside the slide (3) in the field-free space.



GB 2 140 976 A

SPECIFICATION

HF line with a displaceable contact means

- 5 The invention relates to an HF line with a displaceable contact means (e.g. a short circuiting slide), which has electrically conductive elements which are spring loaded in the direction of the surface of the HF line to be contacted and which are guided in the contact means.

10 In HF lines, i.e. coaxial lines or waveguides, displaceable contact means are known to be required in conjunction with the tuning and/or adaptation of terminal transmitter stages and filters; with the transmitter outputs which are customary nowadays, the contact means have to take on short circuiting currents of sometimes far above 1000 amps. Some known contact making elements are, for example, slotted spring blades, where the contact making places may possibly be coated with special contact materials such as copper plated carbon, silver plated carbon, and the like. For extremely high short circuiting currents of the above-mentioned magnitude, however, such contact means are only appropriate under certain conditions, since high enough contact forces cannot be obtained.

An HF line with a short circuiting slide has therefore been used, provided with spheres which are spring loaded in the direction of the surface of the HF line to be contacted, and which are guided in the short circuiting slide. Although this method gives a strong contact force, which is essential to a low transition resistance, such spheres cannot be made particularly well from conventional contact materials, and they are supported in the slide only at three points, so that the heat which is inevitably generated can only be dissipated with difficulty. A further problem is that a short circuiting slide of this type, like a short circuiting slide with spring blades as the contact making elements, presupposes narrow tolerancing of the HF line, the very lines of large cross section which are used for high HF outputs, yet they show considerable deviation from the geometrical circular or rectangular cross section.

The need, therefore, exists for means to improve an HF line with a displaceable contact means of the above-mentioned type, in such a way that it can be used for extremely strong currents and is indifferent to tolerances.

According to the invention, the contact making elements in an HF line comprise cylindrical contact rods which are guided in notches of V-shaped cross-section in the contact means.

Such contact rods may be made of contact materials particularly appropriate to this application, such as silver plated carbon; they lie in the notches in the contact means in two lines, thereby both reducing the transition resistance and improving heat dissipation. The rods also allow for a long displacement path without any increase in the transition resistance; they can therefore bridge over and compensate for large tolerances in the gap between the contact means and the wall of the coaxial line or waveguide to be contacted.

An advantageous embodiment provides for rods to be loaded by helical springs, so that the strength of the contact force can be influenced within broad limits by the hardness of the spring.

- 70 A further reduction in transition resistance between the rods and the contact means, with simultaneous improved dissipation of heat is obtained in a further embodiment, where the contact rods are held in the V-shaped notches by biased leaf springs which are arranged parallel with the contact rods, in the field free chamber of the contact means.

Since for constructional reasons the contact rods cannot be arranged in any desired proximity to one another it is advantageous, if complete HF short circuiting is to be achieved, for the contact means to be provided at its field-free side with contact blades which are electrically in parallel with the contact rods and applied resiliently to the surface to be contacted.

An HF line with a displaceable contact means according to the invention is illustrated in the accompanying drawings, in which:

Figure 1 is a section through a coaxial line with a short circuiting side as the contact means and

Figure 2 is a section taken along the line A-A in Figure 1.

Between the inner conductor 1 and the outer conductor 2 of the coaxial line illustrated there is a short circuiting slide 3. This comprises an annular plate 3a facing towards the high frequency field and an annular plate 3b facing towards the field-free space. The plate 3b merges integrally into a collar of spring blades 4 surrounding the inner conductor 1 and into a collar of spring blades 5 lying against the outer conductor 2.

As will be seen from Figure 2, the plate 3a is provided with closely adjacent V-shaped notches 6 containing contact rods 7. The rods 7 are pressed against the surfaces of the V-shaped notches 6 by biased springs 8 which are clamped in between the plates 3a and 3b. Each contact rod 7 is seated longitudinally displaceably on a guide pin 9 and is located by a helical compression spring 10. The other end of the spring bears against a holding means 11 whereby the pin 9 is fixed to the plate 3A.

CLAIMS

1. An HF line with a displaceable contact means (e.g. a short circuiting slide), which has electrically conductive elements which are spring loaded in the direction of the surface of the HF line to be contacted and which are guided in the contact means, wherein the elements comprise cylindrical contact rods which are guided in notches of V-shaped cross section in the contact means.
2. An HF line according to Claim 1, wherein the contact rods are biased axially by helical compression springs.
3. An HF line according to Claim 1 or 2, wherein the contact rods are held in the V-shaped notches by leaf springs, which are arranged on the field-free chamber of the contact means parallel with the contact rods.
4. An HF line according to any of Claims 1-3, wherein the contact means is provided at its field-

free side with contact blades which are electrically in parallel with the contact rods and which resiliently engage the surfaces to be contacted.

- 5 An HF line with a displaceable contact means constructed and arranged substantially as hereinbefore described and shown in the accompanying drawings.

Printed in the UK for HMSO, D8818935, 10/84, 7102.
Published by The Patent Office, 25 Southampton Buildings, London,
WC2A 1AY, from which copies may be obtained.